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Ex 89
II

MAR 14 1917
S. R. S. Doc. 44.

S. R. S. Doc. 44. Ext. S.

No. A-86.

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES,
COOPERATING.

STATES RELATIONS, SERVICE,
OFFICE OF EXTENSION WORK, SOUTH,
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VELVET BEANS.

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INTRODUCTION.

Velvet beans are the most vigorous of all annual legumes in the regions to which they are adapted. When first introduced into Florida, about 40 years ago, the velvet bean was used mainly as an ornamental vine to grow on trellises or porches. Its very vigorous growing habits, however, soon led to its being utilized as a cover and green-manure crop. Still later its value as a forage crop was realized, and during the past 20 years, and especially during the last 10 years, its culture has greatly increased.

Until 1906 only one variety of velvet bean was known in America, but during recent years the Department of Agriculture has introduced about 20 other varieties, and many hybrids have been secured by breeding. While the original variety possesses velvety hairy pods which gave rise to the common name, many of the other sorts have smooth or nearly smooth pods. Nevertheless, the common name velvet bean is now applied to all the varieties, which are much alike in growth and appearance, and differ mainly in the pod and seed characters and in the length of season required.

The old variety, the Florida velvet bean, rarely matures north of the parallel marking the northern boundary of Florida. This fact has limited its agricultural use mainly to Florida and the immediate vicinity of the Gulf coast. At the present time, however, several early varieties are utilized, so that the crop has become agriculturally

NOTE.—This circular is intended especially for farmers in the cotton belt who desire to diversify their farming by partly replacing cotton as the sole money crop by other profitable crops.

valuable much farther north. The areas to which velvet bean culture is well adapted are shown on the accompanying map (fig. 1).

The agricultural use of velvet beans is rapidly increasing, but the value of the crop is even yet too little appreciated. For green-manure purposes it is unexcelled. For pasturing after the pods mature it has no equal among legumes. Recently prepared feeds composed of the ground pods and seeds have come into high favor, so that velvet beans are assuming increased importance as a money crop.

SOILS FOR VELVET BEANS.

The chief soil requirement of velvet beans is good drainage. They succeed well on every type of soil that occurs in the South, and on



FIG. 1.—Approximate northern limits of the areas within which different varieties of velvet beans will mature: (1) Yokohama velvet bean, (2) the Chinese and Georgia velvet beans, and (3) the Florida velvet bean.

poor sandy soils particularly will far outyield any other legume. The yield of vines or pods is of course affected by the fertility of the soil, as are the yields of other crops. On very poor soil a moderate application of fertilizer is desirable. This is particularly true of phosphatic fertilizers. Velvet beans secure much of the nitrogen they need from the air.

VARIETIES.

Florida velvet bean.—This is the oldest and best known variety. It is a late sort, rarely maturing pods north of Florida and the immediate Gulf coast. The flowers are purple; the pods black, hairy, 2 to 2½ inches long, as thick as broad; seeds nearly round, gray and brown marbled. One bushel of seed will plant 4 to 5 acres if sown 5 feet apart each way.

White-seeded Florida velvet bean.—Exactly like the last, but the seeds white or nearly so.

Georgia velvet bean.—This is also known as Early Florida and Hundred Day Speckled. This variety developed in Georgia about 1910 and has rapidly come into high favor, as it will mature as far north as Virginia and Tennessee. It differs from the Florida velvet bean only in its greater earliness, but it will not mature in as short a period as 100 days, usually requiring about five months.

Alabama velvet bean.—This variety is medium early, maturing later than the preceding but earlier than the Florida.

Lyon velvet bean.—This variety is similar to the Florida in growth and date of maturing. The flowers are white; the pods nearly smooth, 4 to 6 inches long; and the seeds white and flattened.

Chinese velvet bean.—Exactly like the Lyon variety but earlier, maturing a little later than the Georgia variety.

Yokohama velvet bean.—This is the earliest variety of all, and the plants are not as large as the other sorts. Its flowers are purple; the pods 4 to 6 inches long with close gray hairs; seeds gray, large, flattened.

CHOICE OF VARIETIES.

The map (fig. 1) indicates approximately the limits within which well-known varieties will mature. The sorts with pods like the common Florida velvet bean have the advantage that they do not shatter and also resist decay much better than do the smoother podded sorts. At the present time it would appear that the Georgia velvet bean is the most desirable of the medium-early sorts, but the Chinese seems to produce larger yields of pods. Where the season is too short for these two varieties to mature fully, the Yokohama velvet bean is available, but the value of this variety should be considered in comparison with cowpeas and soy beans. For the extreme South there is wider room for choice, as early maturing varieties may, if desired, be planted later in the season than sorts like the Lyon and Florida.

PLANTING.

Good preparation of the seed bed is just as desirable for velvet beans as for other crops. Early deep plowing followed by thorough harrowing is recommended.

The seed should not be planted until the ground is thoroughly warmed, usually about the time that cotton ordinarily is planted. One bushel of seed of most varieties will be sufficient for about 4 acres if the seeds are planted 18 inches apart in rows 4 feet wide. The Yokohama bean should be planted more closely, as the vines are smaller.

Velvet beans may be sown alone, but it is always preferable to utilize some sort of support upon which the vines may climb. With such support they make more vigorous growth and fruit more heavily. Poles are sometimes used, but they are troublesome and expensive. Most commonly corn and velvet beans are grown together, as the corn stalks provide the necessary support for the vines. A strong-growing variety of corn, like Mexican June, should be used for this purpose. The corn should be planted early, and when about 2 feet high the beans are planted between the hills, either in the row or in the middle. After planting the crop should be cultivated until the vines shade the ground. The vines make such a heavy growth that little corn can be gathered from the field, but when it is grazed little of it will be lost. The only expense for growing the corn is the planting, and that will be more than repaid in the increased yield of the beans. In place of corn any late variety of sorghum may be used. Velvet beans are sometimes planted between the rows of Japanese sugar cane, which furnishes an ideal support. In this case the whole must be pastured, as the vines tie the canes together so that harvesting otherwise is rendered very difficult.

SOIL RENOVATION.

For green manure and soil renovation the velvet bean is unexcelled among field crops adapted to its region. There is some objection to using it in orchards, as the vines climb the trees and thus make considerable additional labor. An ordinary crop of velvet beans amounts to about 2 tons of dry matter per acre, which would contain about 90 pounds of nitrogen. As most of this nitrogen comes from the air, there is added as much of this substance as is contained in about 1,400 pounds of cottonseed meal. Even when the velvet beans are pastured most of this nitrogen is returned to the soil.

At the Alabama Experiment Station a crop of sorghum hay after velvet beans plowed under was nearly double that of a crop after fallow. Oats after velvet beans plowed under yielded four times as much as crops following crab grass and millet; even after velvet-bean stubble the oat crop was nearly as large as that secured when all the velvet beans were plowed under.

In Arkansas, oats, after velvet beans plowed under, yielded 53 bushels of grain as against 36 bushels after oat stubble; wheat gave yields, respectively, of 16 bushels after velvet-bean stubble and 10 bushels after wheat stubble.

PASTURING.

Velvet beans are most commonly utilized by pasturing the crop after it is fully matured or when it has been killed by frosts. The bean will remain on the ground all winter with little or no decay, especially

on sandy soil, so that the pasturage can be preserved a long time. Most commonly, however, it is pastured promptly after the vines are mature or dead, as live stock eat nearly all the dried leaves and smaller stems, as well as the pods and seeds. For finishing animals, good velvet-bean pasturage, together with corn or a similar feed, will produce meat very cheaply.

HAY.

Hay is sometimes made from velvet beans and is considered to be of fair quality but not of equal value to that of cowpeas. The vines are so long and tangled, however, that mowing is very difficult, so that haying the crop is not often practiced.

VELVET-BEAN MEAL.

There is a large and growing market for velvet-bean meal, prepared by grinding the entire pods and seeds. As a concentrated feed this has gained an excellent reputation on the market. The yield of beans to the acre ranges from 20 to 50 bushels, being greatest when the vines are well supported above the ground. The price offered for these beans is often attractive enough to make it good policy to harvest the beans before pasturing the remainder of the crop.

Velvet-bean seeds weigh 60 pounds to the bushel. One hundred pounds of the dry pods will yield 1 bushel of seed.

FEEDING VALUE.

The high value for feed of the pods and seeds of velvet beans has long been recognized by farmers. Excellent results are secured with beef cattle, milch cows, and hogs. At the Florida Experiment Station careful experiments have been conducted to determine the relative feeding value of velvet beans in the pod in comparison with cottonseed meal.

In the case of milch cows it has been found that about 2.7 pounds of velvet beans in the pod produce as much milk as 1 pound of cottonseed meal when each is fed with wheat bran and sorghum silage. But as the velvet-bean ration is much cheaper than the cottonseed meal, the cheapest milk was produced with the velvet bean.

When hogs are fattened on velvet beans alone they make good gains, but the fat produced has a dark color and a disagreeable taste. This seems never to be the case, however, when velvet beans are fed as part only of the ration. The Florida Experiment Station tests gave profitable results from corn and velvet beans mixed, the best gains being made from a feed consisting of three parts corn and one part cracked velvet beans. Hogs usually eat only the seeds, readily shelling them from the pods.

ENEMIES.

The velvet bean is notably free from disease or insect enemies. The plants are entirely immune to the wilt that affects cowpeas, and only under very unusual conditions are affected by root-knot.

Only one insect, the caterpillar of a moth, ever causes any particular injury to velvet beans. This caterpillar usually appears about the time the vines are in flower, and its presence is made evident by the holes eaten in the leaves. When the caterpillar is very abundant the vines may be partly or wholly defoliated. This insect may be destroyed by spraying with Paris green, but it is rarely profitable to do this. Fortunately this insect is rare or at least has thus far caused little damage north of Florida.

(Issued March 10, 1917.)



